that a departure in either direction from these mean pressures of a few pounds per square inch does not make a very considerable difference in steam consumption.

This enables the size of the low-pressure cylinder to be fixed. The diameter of the cylinder is usually about 2-2 to 2-4 times the stroke for triple engines and 1-9 to 2*2 for compounds. The size of the high-pressure cylinder is governed to some extent by the consideration that with valve gear driven by eccentrics in the usual way an earlier cut-off than 0-55 or 0-5 is not very practicable because of the great valve travel required. This
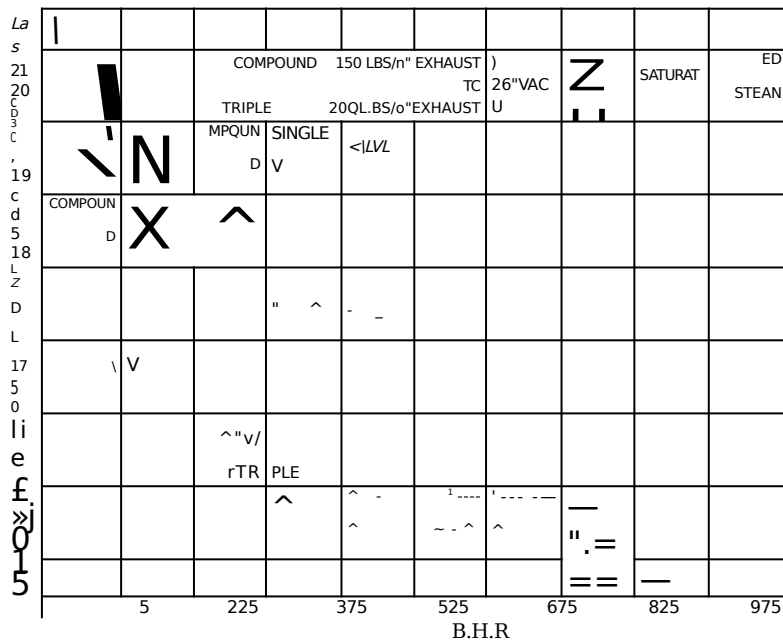

Fig. 35.—Steam Consumption per brake horse-power hour

brings us to another question. What is the mean pressure to be expected after the disturbing factors referred to above have been taken into account? This can be answered only by deductions from diagrams taken from similar engines. The ratio, *actual mean pressure I theoretical mean pressure,* is called the " diagram factor ". For the sake of convenience only, Boyle's law is assumed in calculating the theoretical mean pressure. It represents only approximately the real relations of the pressure and volume of expanding steam, but is sufficiently near the truth to make comparisons of similar conditions fairly trustworthy. The diagram factor varies greatly in different

engines. For a triple-expansion engine it may vary from 0-55 to 0-62 or even 0-65 in cases where the admission line has been well maintained. For compound engines it may be from 0-6 to 0*65 and for simple engines 0-6 to 0-72, depending upon whether the cut-off is early or not. If early, there would probably be considerable throttling past the valve. Obviously the pressure